Grade Five

Mathematics - Grade 5: Critical Areas

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

1. Students apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They develop fluency in calculating sums and differences of fractions, and make reasonable estimates of them. Students also use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense. (Note: this is limited to the case of dividing unit fractions by whole numbers and whole numbers by unit fractions.) **(5.NF.1; 5.NF.2; 5.NF.3; 5.NF.4; 5.NF.6; 5.NF.7)**

2. Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately. **(5.NBT.1; 5.NBT.2; 5.NBT.3; 5.NBT.4; 5.NBT.6; 5.NBT.7)**

3. Students recognize volume as an attribute of three-dimensional space. They understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps. They understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume. They decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes. They measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems. **(5. MD.3; 5. MD.4; 5. MD.5)**

Key:

● Additional Clusters | ＊ Benchmarked Standard

● Major Clusters | ● Supporting |

Vocabulary: Building the Language of Mathematics for Students

Fifth Grade

Operations and Algebraic Thinking	Number and Operations in Base Ten	Number and Operations Fractions	Measurement and Data	Geometry
Write and interpret numerical expressions. parentheses, brackets, braces, numerical expressions **Analyze patterns and relationships.** numerical patterns, rules, ordered pairs, coordinate plane	**Understand the place value system.** place value, decimal, decimal point, patterns, multiply, divide, tenths, thousands, greater than, less than, equal to, ‹, ›, =, compare/comparison, round **Perform operations with multi-digit whole numbers and with decimals to hundredths.** multiplication/multiply, division/division, decimal, decimal point, tenths, hundredths, products, quotients, dividends, divisor, rectangular arrays, area models, addition/add, subtraction/subtract, (properties)-rules about how numbers work, reasoning	**Use equivalent fractions as a strategy to add and subtract fractions.** fraction, equivalent, addition/ add, sum, subtraction/subtract, difference, unlike denominator, numerator, benchmark fraction, estimate, reasonableness, mixed numbers **Apply and extend previous understanding of multiplication and division to multiply and divide fractions.** fraction, numerator, denominator, operations, multiplication/multiply, division/divide, mixed numbers, product, quotient, partition, equal parts, equivalent, factor, unit fraction, area, side lengths, fractional sides lengths, scaling, comparing	**Convert like measurement units within a given measurement system.** conversion/convert, metric and customary measurement From previous grades: relative size, liquid volume, mass, length, kilometer (km), meter (m), centimeter (cm), kilogram (kg), gram (g), liter (L), milliliter (mL), inch (in), foot (ft), yard (yd), mile (mi), ounce (oz), pound (lb), cup (c), pint (pt), quart (qt), gallon (gal), hour, minute, second, a.m., p.m., clockwise, counter clockwise **Present and interpret data.** line plot, length, mass, liquid volume **Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.** measurement, attribute, volume, solid figure, right rectangular prism, unit, unit cube, gap, overlap, cubic units (cubic cm, cubic in. cubic ft. nonstandard cubic units), multiplication, addition, edge lengths, height, area of base	**Graph points on the coordinate plane to solve real-world and mathematical problems.** coordinate system, coordinate plane, first quadrant, points, lines, axis/axes, x-axis, y-axis, horizontal, vertical, intersection of lines, origin, ordered pairs, coordinates, x-coordinate, y-coordinate **Classify two-dimensional figures into categories based on their properties.** attribute, category, subcategory, hierarchy, properties (attributes, features), defining characteristics and non-defining characteristic, , two dimensional From previous grades: polygon, rhombus/rhombi, rectangle, square, triangle, quadrilateral, pentagon, hexagon, cube, trapezoid, half/quarter circle, circle

The Common Core State Standards for Mathematical Practice are practices expected to be integrated into every mathematics lesson for all students Grades K- 12. Below are a few

examples of how these Practices may be integrated into tasks that Grade 5 students complete.

2 | Page Key:

 Practice Explanation and Example

MP1) Make sense of problems and persevere in solving them. Mathematically proficient students in Grade 5 solve problems by applying their understanding of operations with whole numbers, decimals, and fractions including mixed numbers. They solve problems related to volume and measurement conversions. Students seek the meaning of a problem and look for efficient ways to represent and solve it. Fifth graders may consider different representations of the problem and different solution pathways, both their own and those of other students, in order to identify and analyze correspondences among approaches. When they find that their solution pathway does not make sense, they look for another pathway that does. They check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?"

2MP) Reason abstractly and quantitatively. Mathematically proficient students in Grade 5 recognize that a number represents a specific quantity. They extend this understanding from whole numbers to their work with fractions and decimals. This involves two processes— decontextualizing and contextualizing. Grade 5 students decontextualize by taking a real-world problem and writing and solving equations based on the word problem. For example, consider the task, "There are 2 2 3 of a yard of rope in the shed. If a total of 4 1 6 yard is needed for a project, how much more rope is needed?" Students decontextualize the problem by writing the equation 4 1 6 − 2 2 3 =? and then solving it. Further, students contextualize the problem after they find the answer, by reasoning that 1 3/6 or 1 ½ yards of rope is the amount needed. Further, Grade 4 students write simple expressions that record calculations with numbers and represent or round numbers using place value concepts.

MP3) Construct viable arguments and critique the reasoning of others. Mathematically proficient students in Grade 5 construct arguments using representations, such as objects, pictures, and drawings. They explain calculations based upon models and properties of operations and rules that generate patterns. They demonstrate and explain the relationship between volume and multiplication. They refine their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" and "Why is that true?" They explain their thinking to others and respond to others' thinking through either discussions or written responses. In Grade 5, students return to their conjectures and arguments about whole numbers to determine whether they apply to fractions and decimals. For example, they might make an argument based on an area representation of multiplication to show that the distributive property applies to problems involving fractions.

MP4) Model with mathematics. Mathematically proficient students in Grade 5 experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, making a chart, list, or graph, creating equations, etc. Students need opportunities to connect the different representations

and explain the connections. They should be able to use all of these representations as needed. Fifth graders should evaluate their results in the context of the situation and whether the results make sense. They also evaluate the utility of models to determine which models are most useful and efficient to solve problems. Example, when students encounter situations such as sharing a pan of brownies among 6 people, they might first show how to divide the brownies into 6 equal pieces using a picture of a rectangle. The rectangle

divided into 6 equal pieces is a model of the essential mathematics elements of the situation. When the students write the name of each piece in relation to the whole pan as 1/6, they are now modeling the situation with mathematical notation.

MP5) Use appropriate tools strategically. Mathematically proficient students in Grade 5 consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use unit cubes to fill a rectangular prism and then use a ruler to measure the dimensions. They use graph paper to accurately create graphs and solve problems or make predictions from real world data. Estimation is also seen as a tool. For example, in order to solve 3/5 – 1/2, a 5th grader might recognize that knowledge of equivalents of 1/2 is an appropriate tool: since 1/2 is equivalent to 2 ½ fifths, the result is ½ of a fifth or 1/10. This practice is also related to looking for structure (SMP 7), which often results in building mathematical tools that can then be used to solve problems.

MP6) Attend to precision. Mathematically proficient students in Grade 5 continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to expressions, fractions, geometric figures, and coordinate grids. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, when figuring out the volume of a rectangular prism they record their answers in cubic units.

MP7) Look for and make use of structure. Mathematically proficient students in Grade 5 look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to add, subtract, multiply and divide with whole numbers, fractions, and decimals. They examine numerical patterns and relate them to a rule or a graphical representation. For example, when 5th graders calculate 16 X 9, they might apply the structure of place value and the distributive property to find the product: $16 \times 9 = (10 + 6) \times 9 = (10 \times 9) + (6 \times 9)$.

MP8) Look for and express regularity in repeated reasoning. Mathematically proficient students in Grade 5 use repeated reasoning to understand algorithms and make generalizations about patterns. Students connect place value and their prior work with operations to understand algorithms to fluently multiply multi-digit numbers and perform all operations with decimals to hundredths. Students explore operations with fractions with visual models and begin to formulate generalizations. For example, 5th graders might notice a pattern in the change to the product when a factor is increased by 1: 5 X 7 = 35 and 5 X 8 = 40---the product changes by 5; 9 X 4 = 36 and 10 X 4 – 40—the product changes by 4. Fifth graders might then express this regularity by saying something like, "When you change one factor by 1, the product increases by the other factor." As students practice articulating their observations, they learn to communicate with greater precisions (SMP 6). As they explain why these generalizations must be true, they construct, critique, and compare arguments (SMP 3).

4 | Page Key:
Pacing Guide - Year-at-a-Glance - Timing based upon 4 Marking Periods at 9 weeks each

Pacing Guide	Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice
Unit 1 - 9 weeks **Understanding the Place Value System**	● 5.OA.A.1 ● 5.OA.A.2 ● 5.NBT.A.1 ● 5.NBT.A.2* ● 5.NBT.B.5* ● 5.NBT.B.6 ● 5.NBT.A.3 ● 5.NBT.A.4	● Write and interpret numerical expressions ● Understand the place value system ● Perform operations with multi-digit whole numbers and with decimals to hundredths	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others.
Unit 1: *Suggested Open Educational Resources*	5.OA.A.1 Using Operations and Parentheses 5.OA.A.1 Watch out for Parentheses 1 5.NBT.A.1 Which number is it? 5.NBT.A.1 Millions and Billions of People 5.NBT.A.3 Placing Thousandths on the Number Line 5.NBT.A.4 Rounding to Tenths and Hundredths 5.NBT.B.5 Elmer's Multiplication Error		MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.

Unit 2 - 9 weeks	● 5.MD.C.3	● Understand concepts of volume	MP.7 Look for and make use of structure.
	● 5.MD.C.4	● Perform operations with multi-digit whole	
	● 5.MD.C.5	numbers and with decimals to hundredths	
Understanding Volume and Operations on Fractions	● 5.NBT.B.5*	● Use equivalent fractions as a strategy to add and subtract fractions	
	● 5.NF.A.1		
	● 5.NF.A.2	● Apply and extend previous understandings of multiplication and division	MP.8 Look for and express regularity in repeated reasoning.
	● 5.NF.B.3		
	● 5.NF.B.4		

Key:

● Additional Clusters | * Benchmarked Standard

● Major Clusters | ● Supporting |

Unit 2: Suggested Open Educational Resources	5.MD.C.5 Breaking Apart Composite Solids 5.MD.C.5a using Volume to Understand the Associative Property of Multiplication 5.MD.C.5b Cari's Aquarium 5.MD.C Box of Clay 5.NF.A.1 Making S'Mores 5.NF.A.2 Do These Add Up? 5.NF.A Measuring Cups 5.NF.B.3 How Much Pie? 5.NF.B.4b Chavone's Bathroom Tiles	
Unit 3 - 9 weeks **More Operations on Fractions**	● 5.NF.B.4b ● 5.NF.B.5 ● 5.NF.B.6 ● 5.NF.B.7* ● 5.NBT.A.2* ● 5.NBT.B.7* ● 5.MD.A.1	● Apply and extend previous understandings of multiplication and division ● Understand the place value system ● Perform operations with multi-digit whole numbers and with decimals to hundredths ● Convert like measurement units within a given measurement system	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others.

Unit 3: *Suggested Open Educational Resources*	5.NF.B.4b New Park 5.NF.B.5 Comparing Heights of Buildings 5.NF.B.5 Grass Seedlings 5.NF.B.5b Mrs. Gray's Homework Assignment 5.NF.B.6 To Multiply or not to multiply? 5.NF.B.7 Banana Pudding 5.NBT.A.2 Multiplying Decimals by 10 5.NBT.A.2 Marta's Multiplication Error 5.NBT.B.7 The Value of Education 5.MD.A.1, 5.NF.B.3 Converting Fractions of a Unit into a Smaller Unit		MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
Unit 4 - 9 weeks **Coordinate Geometry and Classifying Figures**	● 5.G.A.1 ● 5.G.A.2 ● 5.OA.B.3 ● 5.G.B.3 ● 5.G.B.4 ● 5.MD.B.2 ● 5.NBT.B.5* ● 5.NBT.B.7*	● Graph points on the coordinate plane to solve real-world and mathematical problems ● Analyze patterns and relationships ● Classify two dimensional figures into categories based on their properties ● Represent and interpret data ● Perform operations with multi-digit whole numbers and with decimals to hundredths	

	● 5.NF.B.7*	● Apply and extend previous understanding of multiplication and division	
Unit 4: *Suggested Open Educational Resources*	5.G.A.1 Battle Ship Using Grid Paper 5.G.A.2 Meerkat Coordinate Plane Task 5.OA.B.3 Sidewalk Patterns 5.G.B.3 Always, Sometimes, Never 5.G.B.4 What is a Trapezoid? (Part 2) 5.MD.B.2 5.NF.A.1 Fractions on a Line Plot 5.NBT.B.7, 5.NF.B.3 What is 23 divided by 5? 5.NF.B.7c Salad Dressing		

____ Language Arts ____ Science ____ Social Studies ____ World Languages ____ Arts

21st Century Themes

___ Global Awareness ___ Financial, Economic, Business and Entrepreneurial Literacy ___ Civic Literacy ___ Health Literacy ___ Environmental Literacy

21st Century Life and Careers Standards

<u>**Career Ready Practices:**</u>

☒ 9.4.5.DC.1: Explain the need for and use of copyrights

☒ 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a)

☒ 9.4.5.DC.3: Distinguish between digital images

that can be reused freely and those that have copyright restrictions.

☒ 9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6)

☐ 9.4.5.DC.4: Model safe, legal, and ethical behavior when

using online or offline technology (e.g., 8.1.5.NI.2)

☐ 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2)

☐ 9.1.5.CR.1: Compare various ways to give back and relate them to

your strengths, interests, and other personal factors.

☒ 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1)

☒ 9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.

☒ 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

☐ 9.1.5. EG.5: Identify sources of consumer protection and assistance..

☒ 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3)

Unit 1 Grade 5- Understanding Place Value System

Content Standards	Suggested Standards for Mathematical Practice and P21 Skills	Critical Knowledge & Skills
● 5.OA.A.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	MP.1 Make sense of problems and persevere in solving them. MP.5 Use appropriate tools strategically. MP.8 Look for and express regularity in repeated reasoning.	Concept(s): ● Standard convention for performing operations (Order of operations, including grouping symbols) Students are able to: ● evaluate numerical expressions that include grouping symbols (parentheses, brackets or braces).

	Critical Thinking and Problem Solving Creativity and Innovation ICT Literacy	● evaluate numerical expressions that include nested grouping symbols (for example, 3 x [5 + (7 - 3)]). Learning Goal 1: Evaluate numerical expressions that contain parentheses, brackets and braces.
● 5.OA.A.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning Critical Thinking and Problem Solving Creativity and Innovation Communication and Information Literacy	Concept(s): ● Order of operations, including grouping symbols. Students are able to: ● write a simple numerical expression when given a verbal description. ● interpret the quantitative relationships in numerical expressions without evaluating (simplifying) the expression. Learning Goal 2: Write numerical expressions when given a verbal description or word problem; interpret numerical expressions without evaluating them.

● 5.NBT. A.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation	Concept(s): ● Quantitative relationships exist between the digits in place value positions of a multi-digit number. Students are able to: ● explain that a digit in one place represents 1/10 of what it would represent in the place to its left. ● explain that a digit in one place represents ten times what it would represent in the place to its right. Learning Goal 3: Explain that a digit in one place represents 1/10 of what it would represent in the place to its left and ten times what it would represent in the place to its right.
● 5.NBT. A.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): ● Scientific notation and exponents Students are able to: ● explain patterns in the number of zeros of the product when multiplying a whole number by powers of 10. ● write powers of 10 using whole-number exponents.

a power of 10. Use whole-number exponents to denote powers of 10.	Critical Thinking and Problem Solving Creativity and Innovation	Learning Goal 4: Explain patterns in the number of zeros in the product when a whole number is multiplied by a power of 10; represent powers of 10 using whole-number exponents.

● 5.NBT. B.5. Fluently multiply multi-digit whole numbers using the standard algorithm. *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration ICT Literacy	Concept(s): No new concept(s) introduced Students are able to: ● multiply a whole number of up to a four digits by a whole number of up two digits using the standard algorithm with accuracy and efficiency. Learning Goal 5: Use the standard algorithm to multiply a whole number of up to a four digits by a whole number of up two digits.

● 5.NBT. B.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of
operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular
arrays, and/or area models.
	MP.2 Reason abstractly and quantitatively.
	MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.
	MP.7 Look for and make use of structure.
	
	Critical Thinking and Problem Solving
	Creativity and Innovation
	Communication and Collaboration
		Concept(s): No new concept(s) introduced
		Students are able to:
		    ● divide to find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors using strategies based on place value, properties of operations, and the relationship between multiplication and division.
		    ● represent these operations with equations, rectangular arrays, and area models.
		    ● explain the calculation by referring to the model (equation, array, or area model).
		
		Learning Goal 6: Calculate whole number quotients of whole numbers with 4-digit dividends and 2-digit divisors; explain and represent calculations with equations, rectangular arrays, and area models.

● 5.NBT. A.3. Read, write, and compare decimals to thousandths.
5.NBT. A.3a. Read and write decimals to thousandths using base-ten numerals, number
	MP.2 Reason abstractly and quantitatively.
	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.
		Concept(s):
		    ● Multiple representations of whole numbers
		Students are able to:
		    ● read and write decimals to thousandths using base-ten numerals.
		    ● read and write decimals to thousandths using number names.

names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$. 5.NBT. A.3b. Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.	MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration	● read and write decimals to thousandths using expanded form. ● compare two decimals to thousandths using $>$, $=$, and $<$ symbols. ● compare decimals when each is presented in a different form (base-ten numeral, number name, and expanded form). Learning Goal 7: Compare two decimals to thousandths using $>$, $=$, and $<$ for numbers presented as base ten numerals, number names, and/or in expanded form.
● 5.NBT. A.4. Use place value understanding to round decimals to any place.	MP.2 Reason abstractly and quantitatively. MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation	Concept(s): No new concept(s) introduced Students are able to: ● round decimals to any place value. Learning Goal 8: Round decimals to any place value.

Key:

Unit 1 Grade 5- Understanding Place Value System

District/School Formative Assessment Plan District/School Summative Assessment Plan

Released item sets
https://sites.google.com/site/releaseditemsets/

formative assessment material- Engageny.org under their New York State Mathematics Curriculum Materials:
https://www.engageny.org/sites/default/files/resource/attachments/g5-m1-full_module.pdf

NC 3-5 Instructional and Assessment Tasks for the CCSS in Mathematics http://3-5cctask.ncdpi.wikispaces.net/Fifth+Grade+Tasks

Classwork

Exit tickets	Benchmarks
White boards	Chapter tests
Individual and group work	End of unit tests
Math journals	Performance tasks Extended projects PARCC
Quizzes	Renaissance Learning

Benchmark Assessment Alternative Assessment

Renaissance/STAR MAP Testing

Extension Projects

DRA Assessment 12 | Page Key:

Teacher Created Assessments

Performance Based Assessments
Benchmark Assessment within Envision/Go Math/Eurek/iReady

State Testing Results

Focus Mathematical Concepts- Understanding Place Value System

Prerequisite skills:
4.OA.A.1

4.OA.A.2
4.NF.C.5
4.NF.C.6
4.NF.C.7
4.NBT.B.4
4.NBT.B.5
4.NBT.B.6
4.NBT.A.2
4.NBT.A.1

Common Misconceptions:
Students may believe the order in which a problem with mixed operations is written is the order to solve the problem. The use of mnemonic phase "Please Excuse My Dear Aunt Sally" to remember the order of operations (Parentheses, Exponents, Multiplication, Division, Addition, Subtraction) can also mislead students to always perform multiplication before division and addition before subtraction. To correct this thinking, students need to understand that addition and subtraction are inverse operations and multiplication and division are inverse operations, as in they have the same "impact". At this level, students need opportunities to explore the "impact" of the various operations on numbers and solve equations starting with the operation of greatest "impact".

Allow students to use calculators to determine the value of the expression and then discuss the order the calculator used to evaluate the expression. Do this with four-function and scientific calculators. Students need lots of experience with writing multiplication in different ways. Multiplication can be indicated with a raised dot, such as 4 · 5, with a raised cross symbol, such as 4 × 5, or with parentheses, such as 4(5) ���� (4)(5). Note that the raised cross symbol is not the same as the letter "x", and so care should be taken when writing or typing it. Students need to be exposed to all three notations and should be challenged to understand that all are useful. In instruction, teachers are encouraged to use a notation and stay consistent. Students also need help and practice remembering the convention that we write a rather than 1 · a or 1a, especially in expressions such as a + 3a.

Key:
A common misconception that students have when trying to extend their understanding of whole number place value to decimal place value is that as you move to the left of the decimal point, the number increases in value. Reinforcing the concept of powers of ten is essential for addressing this issue. A second misconception that is directly related to comparing whole numbers is the idea that the longer the number the greater the number. With whole numbers, a 5-digit number is always greater than a 1-, 2-, 3-, or 4-digit number. However, with decimals a number with one decimal place may be greater than a number with two or three decimal places. For example, 0.5 is greater than 0.12, 0.009 or 0.499

Students might compute the sum or difference of decimals by lining up the right-hand digits as they would whole number. To help students add and subtract decimals correctly, have them first estimate the sum or difference. Providing students with a decimal-place value chart will enable them to place the digits in the proper place.

Number Fluency:
5.NBT.B.5 Multi-digit multiplication

District/School Tasks District/School Primary and Supplementary Resources

PARCC released items
https://prc.parcconline.org/assessments/parcc-released-items

PARCC practice tests
https://parcc.pearson.com/practice-tests/math/

Math release set folder- contains two Word docs
https://sites.google.com/site/releaseditemsets/home/math-release-1

NC tasks/assessments
http://3-5cctask.ncdpi.wikispaces.net/

http://mrnussbaum.com/orderops/

Order Ops provides students with expressions to solve in bite sized chunks. Students must pay attention to which grouping and operation must be performed according to the conventions of order of operations.

Framework for 21st Century Learning

http://www.p21.org/our-work/p21-framework

NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/
Arizona flip book
http://www.katm.org/flipbooks/5%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces

http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Grade 5

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

TECHNOLOGY CONNECTION:

Key:

http://www.nzmaths.co.nz/resource/four-fours-challenge?parent_node This link provides teachers with some additional, student-centered lessons to develop the concept of order of operations.

www.gogetwaggle.com
www.commoncoresheets.com
www.studyisland.com
www.math-aids.com
www.sumdog.com
www.tenmarks.com
www.edulastic.com
www.go.math.com

Google Classroom

Essential Questions

Why is it important to follow an order of operations?

How can I effectively critique the reasoning of others?

How can I write an expression that demonstrates a situation or context?

How can an expression be written given a set value?

What is the difference between an equation and an expression?

In what kinds of real world situations might we use equations and expressions?

How can we evaluate expressions?

How can an expression be written?

How does multiplying a whole number by a power of ten affect the product?

How can estimating help us when solving multiplication problems?

What strategies can we use to efficiently solve multiplication problems

How can I use what I know about multiplying multiples of ten to multiply two whole numbers?

What is the relationship between decimals and fractions?

How can we read, write, and represent decimal values?

How are decimal numbers placed on a number line?

How can rounding decimal numbers be helpful?

How can you decide if your answer is reasonable?

How do we compare decimals?

How are decimals used in batting averages?

How can estimation help me get closer to 1?

How can I keep from going over 1?

Why is place value important when adding whole numbers and decimal numbers?

How does the placement of a digit affect the value of a decimal number?

Why is place value important when subtracting whole numbers and decimal numbers?

What strategies can I use to add and subtract decimals?

How do you round decimals?

How does context help me round decimals?

Special Education Students English Language Learners Students at Risk of School Failure Gifted and Talented Students Students with 504 Plans

● Provide a checklist for long, detailed tasks
● Use concrete examples of concepts before teaching the abstract
● Highlight important concepts to be learned in text of material ● Provide concrete examples for homework/class work assignments
● Give additional presentations by varying the methods using repetition, simpler explanations and modeling
● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson
● Utilize visual aids and graphic

organizers
● Utilize manipulative, hands-on activities
● Provide graph paper for computation
● Additional time to complete activities/assignments/projects/assessments
● Modify or provide an option for alternative activities/assignments/projects/assessments
● Use enVision Spanish Resources
● Provide text to speech for math problems
● Use of translation dictionary or software
● Confer frequently

● Adapt a Strategy-Adjusting strategies for ESL students: http://www.teachersfirst.com/co n tent/esl/adaptstrat.cfm
● Familiarize student with new vocabulary before beginning lesson
● Utilize visual aids and graphic organizers
● Utilize manipulative, hands-on activities
● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes
● Review prerequisite skills ● http://www.wida.us/standards/el p.aspx
● Tiered interventions following

RTI framework
● RTI Intervention Bank ● NJDOE resources
● Utilize online resources such as www.tenmarks.com
● EnVision K-5 intervention supports
● Modify activities/assignments/projects/assessments
● Provide an option for alternative activities/assignments/projects/assessments
● Provide higher-order questioning and discussion opportunities
● Utilize exploratory connections to higher grade concepts
● Modify Content

● Adjust Pacing of Content ● Small Group Enrichment ● Individual Enrichment
● Higher-Level Text
● Provide whole group enrichment explorations
● Teach cognitive and methodological skills
● Use center, stations, or contracts ● Organize integrated problem-solving simulations
● Propose interest-based extension activities
● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles
● Provide options, alternatives and choices to differentiate and broaden

the curriculum
- Provide a checklist for long, detailed tasks
- Use concrete examples of concepts before teaching the abstract
- Highlight important concepts to be

learned in text of material ● Provide concrete examples for homework/class work assignments
- Give additional presentations by varying the methods using repetition, simpler explanations

and modeling
- Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson
- Utilize visual aids and graphic organizers

- Utilize manipulative, hands-on activities
- Provide graph paper for computation
- Additional time to complete activities/assignments/projects/a ssessments

- Modify or provide an option for alternative activities/assignments/projects/a ssessments

- Small Group Instruction/Intervention/Remedi ation
- Individual Intervention/Remediation
- Additional Support Materials/ Online resources
- Guided Notes or copy of teacher notes
- Review prerequisite skills
- After School Tutoring
- Chunk activities/assignments/projects/a ssessments into manageable units
- Allow student to receive reading

text in various forms (written, verbal, audio) r on a lower reading level
- Allow student to make test corrections or retake assessment
- Adjust Pacing of Content
- See IEPs of students for specific modifications

Vocabulary Ongoing Modifications
- Propose independent projects based on individual interests ● Additional Support Materials/ Online resources
- After school clubs
- Tiered centers

- Tiered assignments
- Small Group Instruction/Intervention/Remedi ation
- Individual Intervention/Remediation
- Additional Support Materials/ Online resources
- Guided Notes or copy of teacher notes
- Review prerequisite skills ● After School Tutoring
- Chunk activities/assignments/projects/a ssessments into manageable units
- Allow student to receive reading text in various forms (written, verbal, audio) r on a lower reading level
- Allow student to make test corrections or retake assessment ● Adjust Pacing of Content ● See 504 plan for specific accommodations

http://maccss.ncdpi.wikispaces.net/file/view/2014+Building+Vocabulary.pdf
Georgia Department of Education Grade 5 Intervention Table

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Building the language of mathematics

Differentiated centers

Extra time on task

NJ Model Curriculum:

Achieve the Core:

Instructional Best Practices and Exemplars

Students should be given ample opportunities to explore numerical expressions with mixed operations. This is the foundation for evaluating numerical and algebraic expressions that will include whole-number exponents in Grade 6. There are conventions (rules) determined by mathematicians that must be learned with no conceptual basis. For example, multiplication and division are always done before addition and subtraction.

Begin with expressions that have two operations without any grouping symbols (multiplication or division combined with addition or subtraction) before introducing expressions with multiple operations. Using the same digits, with the operations in a different order, have students evaluate the expressions and discuss why the value of the expression is different. For example, have students evaluate $5 \times 3 + 6$ and $5 + 3 \times 6$. Discuss the rules that must be followed. Have students insert parentheses around the multiplication or division part in an expression. A discussion should focus on the similarities and differences in the problems and the results. This leads to students being able to solve problem situations which require that they know the order in which operations should take place.

After students have evaluated expressions without grouping symbols, present problems with one grouping symbol, beginning with parentheses, then in combination with brackets and/or braces. Have students write numerical expressions in words without calculating the value. This is the foundation for writing algebraic expressions. Then, have students write numerical expressions from phrases without calculating them. In Grade 5, the concept of place value is extended to include decimal values to thousandths. The strategies for Grades 3 and 4 should be drawn upon and extended for whole numbers and decimal numbers. For example, students need to continue to represent, write and state the value of numbers including decimal numbers. For students who are not able to read, write and represent multi-digit numbers, working with decimals will be challenging.

Money is a good medium to compare decimals. Present contextual situations that require the comparison of the cost of two items to determine the lower or higher priced item. Students should also be able to identify how many pennies, dimes, dollars and ten dollars, etc., are in a given value. Help students make connections between the number of each type of coin and the value of each coin, and the expanded form of the number. Build on the understanding that it always takes ten of the number to the right

to make the number to the left. Number cards, number cubes, spinners and other manipulatives can be used to generate decimal numbers. For example, have students roll three number cubes, then create the largest and small number to the thousandths place. Ask students to represent the number with numerals and words.

Because students have used various models and strategies to solve problems involving multiplication with whole numbers, they should be able to transition to using standard algorithms effectively. With guidance from the teacher, they should understand the connection between the standard algorithm and their strategies. Connections between the algorithm for multiplying multi-digit whole numbers and strategies such as partial products or lattice multiplication are necessary for students' understanding.

In Grade 5, the concept of place value is extended to include decimal values to thousandths. The strategies for Grades 3 and 4 should be drawn upon and extended for whole numbers and decimal numbers. For example, students need to continue to represent, write and state the value of numbers including decimal numbers. For students who are not able to read, write and represent multi-digit numbers, working with decimals will be challenging. Money is a good medium to compare decimals. Present contextual situations that require the comparison of the cost of two items to determine the lower or higher priced item. Students should also be able to identify how many pennies, dimes, dollars and ten dollars, etc., are in a given value. Help students make connections between the number of each type of coin and the value of each coin, and the expanded form of the number. A dime is worth 10 times as much as a penny, but only 1/10 as much as a dollar. Build on the understanding that it always takes ten of the number to the right to make the number to the left. The place value to the right is always 1/10 of the place to its left. Number cards, number cubes, spinners and other manipulatives can be used to generate decimal numbers. For example, have students roll three number cubes, then use those digits to create the largest and smallest numbers to the thousandths place. Ask students to represent the number using numerals, words and expanded form.

Students should gain ease in converting units of measures in equivalent forms within the same system. To convert from one unit to another unit, the relationship between the units must be known. In order for students to have a better understanding of the relationships between units, they need to use measuring tools in class. The number of units must relate to the size of the unit.

Interdisciplinary Connections Technology Integration

- Language Arts - Interactive Student Notebook
- Language Arts- reading comprehension (decoding words, vocabulary study), problem solving ("problem of the day", word problems, identifying important information), writing ("writing to explain" mathematical thinking)
- Language Arts- Students will use reading comprehension skills to problem solve and effectively explain their mathematical thinking in written form using mathematical terms

   strengthen their understanding of mathematical terms
- Science- representing data, discovering patterns, reading temperature to analyze climates
- Science- utilizing measuring tools to create model, utilizing measurement tools to measure results of an experiment, analyzing data to form new theories, choosing the "best" way to represent data, using data to prove a theory
- Science: Students will collect and analyze data and make calculations involving measurements and other data across all

- Language Arts: Students will connect everyday vocabulary to
  - **8.1.5.A.1** Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems ● **8.1.5.A.3** Use a graphic organizer to organize information about problem or issue.
  - **8.2.5.C.4** Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.
  - **8.2.5.D.3** Follow step by step directions to assemble a product or solve a problem

modules (Life Science, Physical Science, Earth Science
● Social Studies- understand how to read dates properly

Grade 5: Interdisciplinary Connections

_____ **Language Arts** _____ **Science** _____ **Social Studies** _____ **World Languages** _____ **Arts**

21st Century Themes

___ **Global Awareness** ___ **Financial, Economic, Business and Entrepreneurial Literacy** ___ **Civic Literacy** ___ **Health Literacy** ___ **Environmental Literacy**

21st Century Life and Careers Standards

Career Ready Practices:

☒ 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity
(e.g., 8.2.5.ED.2, 1.5.5.CR1a)

☒ 9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6)

☐ 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2)

☒ 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1)

☒ 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

☒ 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3)

☒ 9.4.5.DC.1: Explain the need for and use of copyrights

☒ 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.

☐ 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2)

☐ 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.

☒ 9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.

☐ 9.1.5. EG.5: Identify sources of consumer protection and assistance..

Unit 2 Grade 5- Understanding Volume and Operations on Fractions		
Content Standards	**Suggested Standards for Mathematical Practice and P21 Skills**	**Critical Knowledge & Skills**
● 5.MD.C.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. 5.MD.C.5a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit"	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	Concept(s): ● Volume is the amount of space inside a solid (3-dimensional) figure. ● Cubes with side length of 1 unit, called "a unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. ● Solid figures which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. ● Volume of a solid can be determined using unit cubes of other dimensions. Students are able to:

of volume, and can be used to measure volume. 5.MD.C.5b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. ● 5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.	Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration Information Literacy	● count unit cubes in order to measure the volume of a solid. ● use unit cubes of centimeters, inches, and/or other units to measure volume. Learning Goal 1: Measure volume by counting the total number cubic units required to fill a figure without gaps or overlaps.

● 5.MD.C.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. 5.MD.C.5a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. 5.MD.C.5b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration ICT Literacy	Concept(s): ● Volume is additive: volumes of composite solids can be determined by adding the volumes of each solid. Students are able to: ● pack right rectangular prisms with cubes to find volume and multiply side lengths of the right rectangular prism to find volume, showing that they are the same. ● pack right rectangular prisms with cubes to find volume and multiply height by the area of the base, showing that they are the same. ● explain how both volume formulas relate to counting the cubes in one layer and multiplying that value by the number of layers (height). ● write the volume of an object as the product of three whole numbers. ● solve real-world and mathematical problems using the formulas $V = l \times w \times h$ and $V = B \times h$. ● find the volume of a composite solid composed of two right rectangular prisms. Learning Goal 2: Show that the volume of a right rectangular prism found by counting all the unit cubes is the same as the formulas $V = l \times w \times h$ or $V = B \times h$. Learning Goal 3: Apply formulas to solve real world and mathematical problems involving volumes of right rectangular prisms that have whole number edge lengths. Learning Goal 4: Find the volume of a composite solid figure composed of two non-overlapping right rectangular prisms, applying this strategy to solve real-world problems.

context of solving real world and mathematical problems. 5.MD.C.5c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.		
● 5.NBT. B.5. Fluently multiply multi-digit whole numbers using the standard algorithm. *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration Information Literacy	Concept(s): No new concept(s) introduced Students are able to: 　　　● multiply multi-digit whole numbers with accuracy and efficiency. Learning Goal 5: Fluently multiply multi-digit whole numbers with accuracy and efficiency.

● 5.NF.A.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/1 (in general, a/b + c/d = (ad + bc)/bd).*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation	Concept(s): 　　● Equivalent fractions can be used to add and subtract fractions. Students are able to: 　　● produce an equivalent sum (or difference) of fractions with like denominators from the original sum (or difference) of fractions that has unlike denominators. ● add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions. Learning Goal 6: Add and subtract fractions (including mixed numbers) with unlike denominators by replacing the given fractions with equivalent fractions having like denominators

	Communication and Collaboration Information Literacy	
● 5.NF.A.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. 　*For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration ICT Literacy	Concept(s): No new concept(s) introduced Students are able to: 　　● add and subtract fractions, including mixed numbers, with unlike denominators to solve word problems. 　　● represent calculations and solutions with visual fraction models and equations ● estimate answers using benchmark fractions and explain whether the answer is reasonable. 　　● estimate answers by reasoning about the size of the fractions and explain whether the answer is reasonable. Learning Goal 7: Solve word problems involving adding or subtracting fractions with unlike denominators, and determine if the answer to the word problem is reasonable, using estimations with benchmark fractions.

● 5.NF.B.3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration ICT Literacy	Concept(s): ● Fractions represent division. Students are able to: ● represent a fraction as a division statement ($a/b = a \div b$). ● divide whole numbers in order to solve real world problems, representing the quotient as a fraction or a mixed number. ● represent word problems involving division of whole numbers using visual fraction models and equations. Learning Goal 8: Interpret a fraction as a division of the numerator by the denominator; solve word problems in which division of whole numbers leads to fractions or mixed numbers as solutions.

what two whole numbers does your answer lie?		

● 5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 	
    5.NF.B.4a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)*
 	
    5.NF.B.4b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
	MP.1 Make sense of problems and persevere in solving them.
	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others.
	MP.4 Model with mathematics.
	MP.5 Use appropriate tools strategically. MP.6 Attend to precision.
	MP.7 Look for and make use of structure.
	
	Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration Information Literacy
	ICT Literacy
		Concept(s): No new concept(s) introduced
		Students are able to:
		    ● for whole number or fraction q, represent $(a/b) \times q$ as a parts of a partition of q into b equal parts [e.g. using a visual fraction model, $(3/4) \times 5$ can be represented by 3 parts, after partitioning 5 objects into 4 equal parts].
		    ● for whole number or fraction q, represent $(a/b) \times q$ as $a \times q \div b$ [e.g. showing that $(2/5) \times 3$ is equivalent to $(2 \times 3) \div 5$].
		    ● from a story context, interpret $(a/b) \times q$ as a parts of a partition of q into b equal parts.
		    ● tile a rectangle having fractional side lengths using unit squares of the appropriate unit fraction [e.g. given a 3 ¼ inch x 7 ¾ inch rectangle, tile the rectangle using ¼ inch tiles].
		    ● show that the area found by tiling with unit fraction tiles is the same as would be found by multiplying the side lengths.
		
		Learning Goal 9: For whole number or fraction q, interpret the product $(a/b) \times q$ as a parts of a whole partitioned into b equal parts added q times (e.g. using a visual fraction model).
		Learning Goal 10: Tile a rectangle with unit fraction squares to find the area and multiply side lengths to find the area of the rectangle, showing that the areas are the same.

Unit 2 Grade 5- Understanding Volume and Operations on Fractions

District/School Formative Assessment Plan District/School Summative Assessment Plan Benchmarks

Released item sets

https://sites.google.com/site/releaseditemsets/

formative assessment material- Engageny.org under their New York State Mathematics Curriculum Materials:
https://www.engageny.org/sites/default/files/resource/attachments/g5-m1-full-mo dule.pdf

End of unit tests

Performance tasks Extended projects PARCC

Renaissance Learning

NC 3-5 Instructional and Assessment Tasks for the CCSS in Mathematics http://3-5cctask.ncdpi.wikispaces.net/Fifth+Grade+Tasks

http://illuminations.nctm.org/ActivityDetail.aspx?ID=6
Determining the Volume of a Box by Filling It with Cubes, Rows of Cubes, or Layers of Cubes

Georgia Formative Assessment Task
https://www.georgiastandards.org/Georgia-Standards/Frameworks/5th-Math-Unit -4.pdf

Quizzes

Classwork

Exit tickets

Key:

White boards
Chapter tests

Individual and group work

Math journals

Benchmark Assessment Alternative Assessment

Renaissance/STAR

MAP Testing

DRA Assessment

Benchmark Assessment within Envision/Go

Math/Eurek/iReady State Testing Results

Teacher Created Assessments Performance Based

Focus Mathematical Concepts Understanding Volume and Operations on Fractions -

Prerequisite skills:
3.MD.C.5
3.OA.B.5
4.MD.A.3
4.NBT.B.4
4.NBT.B.5
4.NF.A.1
4.MD.A.2
4.NF.B.3
4.NF.B.4

Common Misconceptions:
Students often mix up models when adding, subtracting or comparing fractions. Students will use a circle for thirds and a rectangle for fourths when comparing
fractions with thirds and fourths. Remind students that the representations need to be from the same whole models with the same shape and size.

Key:
Students often mix models when adding, subtracting or comparing fractions. Students will use a circle for thirds and a rectangle for fourths when comparing fractions with thirds
and fourths. Remind students that the representations need to be from the same whole models with the same shape and size Students may believe that multiplication always results
in a larger number. Using models when multiplying with fractions will enable students to see that the results will be smaller. Additionally, students may believe that division always
results in a smaller number. Using models when dividing with fractions will enable students to see that the results will be larger.

Students are unsure as to which units to use to measure volume because they are not sure what they are measuring. Also, they may confuse the need to find volume with area.

Number Fluency:
 5.NBT.B.5 Multi-digit multiplication

Key:

District/School Tasks District/School Primary and Supplementary Resources

PARCC released items
https://prc.parcconline.org/assessments/parcc-released-items

www.gogetwaggle.com
www.commoncoresheets.com
www.studyisland.com

PARCC practice tests
https://parcc.pearson.com/practice-tests/math/

www.math-aids.com
www.sumdog.com
www.tenmarks.com

Math release set folder- contains two Word docs
https://sites.google.com/site/releaseditemsets/home/math-release-1

www.edulastic.com
www.go.math.com

NC tasks/assessments
http://3-5cctask.ncdpi.wikispaces.net/

Google Classroom

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Essential Questions

How are equivalent fractions helpful when solving problems?

How can a fraction be greater than 1?

How can a fraction model help us make sense of a problem?

How can comparing factor size to 1 help us predict what will happen to the product?
Framework for 21st Century Learning

http://www.p21.org/our-work/p21-framework

NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/
Arizona flip book

http://www.katm.org/flipbooks/5%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces

http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Grade 5

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Mentor texts that may be useful for teaching this unit are listed below.
My Half Day by Doris Fisher
Ed Emberly's Picture Pie by Ed Emberley
Two Ways to Count to ten by Ruby Dee
My Even Day by Doris Fisher
The Wishing Club: A story about fractions by Donna Jo Naoli

Key:

How can decomposing fractions or mixed numbers help us model fraction multiplication?

How can decomposing fractions or mixed numbers help us multiply fractions? How can

fractions be used to describe fair shares?

How can fractions with different denominators be added together?

How can looking at patterns help us find equivalent fractions?

How can making equivalent fractions and using models help us solve problems?

How can modeling an area help us with multiplying fractions?

How can we describe how much someone gets in a fair-share situation if the fair share is less than 1? How

can we model an area with fractional pieces?

How can we tell if a fraction is greater than, less than, or equal to one whole?

How does the size of the whole determine the size of the fraction?

What connections can we make between the models and equations with fractions?

What do equivalent fractions have to do with adding and subtracting fractions? What

does it mean to decompose fractions or mixed numbers?

What models can we use to help us add and subtract fractions with different denominators? What

strategies can we use for adding and subtracting fractions with different denominators? When

should we use models to solve problems with fractions?

How do we measure volume?

How are area and volume alike and different?

Key:

How can you find the volume of cubes and rectangular prisms?

What is the relationship between the volumes of geometric solids?

Why are some tools better to use than others when measuring volume?

Why is volume represented with cubic units and area represented with square units?

Special Education Students	English Language Learners	Students at Risk of School Failure	Gifted and Talented Students
● Provide a checklist for long, detailed tasks	● Use concrete examples of concepts before teaching the abstract ● Highlight important concepts to be learned in text of material	● Provide concrete examples for homework/class work assignments ● Give additional presentations by varying the methods using	repetition, simpler explanations and modeling ● Give written directions to supplement verbal directions

- Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers
- Utilize manipulative, hands-on activities
- Provide graph paper for computation ● Additional time to complete activities/assignments/projects/assessments
    - Use enVision Spanish Resources ● Provide text to speech for math problems
    - Use of translation dictionary or software
    - Confer frequently
    - Adapt a Strategy-Adjusting

- strategies for ESL students: http://www.teachersfirst.com/content/esl/adaptstrat.cfm
- Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers
    - Utilize manipulative, hands-on activities
    - Additional Support Materials/ Online resources
- Guided Notes or copy of teacher notes
- Review prerequisite skills
- http://www.wida.us/standards/elp.as px
    - Tiered interventions following

- RTI framework
    - RTI Intervention Bank ● NJDOE resources
    - Utilize online resources such as www.tenmarks.com
    - EnVision K-5 intervention supports
- Modify activities/ assignments/projects/assessments ● Provide an option for alternative activities/assignments/projects/assessments
    - Provide higher-order questioning and discussion opportunities
    - Utilize exploratory connections to higher grade concepts

- Modify Content
- Adjust Pacing of Content
- Small Group Enrichment
- Individual Enrichment
- Higher-Level Text
- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use center, stations, or contracts ● Organize integrated problem-solving simulations
- Propose interest-based extension activities

Key:

- Modify or provide an option for alternative activities/assignments/projects/assessments
- Small Group Instruction/Intervention/Remediatio n
- Individual Intervention/Remediation
- Additional Support Materials/ Online resources
- Guided Notes or copy of teacher notes
- Review prerequisite skills
- After School Tutoring
- Chunk activities/assignments/projects/assessments into manageable units
    - Allow student to receive reading text in various forms (written, verbal, audio) ron a lower reading level
- Allow student to make test

- corrections or retake assessment
- Adjust Pacing of Content
- See IEPs of students for specific modifications

Students with 504 Plans

- Provide a checklist for long, detailed tasks

- Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles
- Provide options, alternatives and choices to differentiate and broaden the curriculum
- Propose independent projects based on individual interests

- ●AdditionalSupportMaterials/Online resources
  - ●Afterschoolclubs

- ●Tieredcenters
- ●Tieredassignments

Key:
- ● Use concrete examples of concepts before teaching the abstract
- ● Highlight important concepts to be learned in text of material
- ● Provide concrete examples for homework/class work assignments ●
Give additional presentations by varying the methods using repetition, simpler explanations and modeling
- ● Give written directions to supplement verbal directions
- ● Familiarize student with new

vocabulary before beginning lesson ●
Utilize visual aids and graphic organizers
- Utilize manipulative, hands-on
  activities
- Provide graph paper for computation ●
Additional time to complete
activities/assignments/projects/asses
sments
- Modify or provide an option for
  alternative
  activities/assignments/projects/asses
  sments
- Small Group
  Instruction/Intervention/Remediatio n
- Individual Intervention/Remediation ●
Additional Support Materials/ Online
resources

- Guided Notes or copy of teacher
  notes
- Review prerequisite skills
- After School Tutoring
- Chunk
  activities/assignments/projects/asses
  sments into manageable units
- Allow student to receive reading
  text in various forms (written,
  verbal, audio) r on a lower reading
  level
- Allow student to make test
  corrections or retake assessment
- Adjust Pacing of Content
- See 504 plan for specific
  accommodations

Vocabulary Ongoing Modifications

Building the language of mathematics

http://maccss.ncdpi.wikispaces.net/file/view/2014+Building+Vocabulary.pdf
Georgia Department of Education Grade 5 Intervention Table

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Differentiated centers

Extra time on task

NJ Model Curriculum:

https://www.state.nj.us/education/bilingual/curriculum/

Achieve the Core:

https://achievethecore.org/aligned/ccss-aligned-materials-for-ell

-students/

Instructional Best Practices and Exemplars

To add or subtract fractions with unlike denominators, students use their understanding of equivalent fractions to create fractions with the same denominators. Start with problems that require the changing of one of the fractions and progress to changing both fractions. Allow students to add and subtract fractions using different strategies such as number lines, area models, fraction bars or strips. Have students share their strategies and discuss commonalities in them.

Students need to develop the understanding that when adding or subtracting fractions, the fractions must refer to the same whole. Any models used must refer to the same whole. Students may find that a circular model might not be the best model when adding or subtracting fractions. As with solving word problems with whole number operations, regularly present word problems involving addition or subtraction of fractions.

The concept of adding or subtracting fractions with unlike denominators will develop through solving problems. Mental computations and estimation strategies should be used to determine the reasonableness of answers. Students need to prove or disprove whether an answer provided for a problem is reasonable. Estimation is about getting useful answers, it is not about getting the right answer. It is important for students to learn which strategy to use for estimation. Students need to think about what might be a close answer and then explain their reasoning.

Volume refers to the amount of space that an object takes up and is measured in cubic units such as cubic inches or cubic centimeters. Provide students with opportunities to find the volume of rectangular prisms by counting unit cubes, in metric and standard units of measure, before the formula is presented.

Multiple opportunities are needed for students to develop the formula for the volume of a rectangular prism with activities similar to the one described below. Give students one block (a 1- or 2-cubic centimeter or cubic-inch cube), a ruler with the appropriate measure based on the type of cube, and a small rectangular box. Ask students to determine the number of cubes needed to fill the box. Have students share their strategies with the class using words, drawings or numbers. Allow them to confirm the volume of the box by filling the box with cubes of the same size.

By stacking geometric solids with cubic units in layers, students can begin understanding the concept of how addition plays a part in finding volume. This will lead to an understanding of the formula for the volume of a right rectangular prism, b x h, where b is the area of the base. A right rectangular prism has three pairs of parallel faces that are all rectangles. Have students build a prism in layers. Then, have students determine the number of cubes in the bottom layer and share their strategies.

Students should use multiplication based on their knowledge of arrays and its use in multiplying two whole numbers. Ask what strategies can be used to determine the volume of the prism based on

the number of cubes in the bottom layer. Expect responses such as "adding the same number of cubes in each layer as were on the bottom layer" or multiply the number of cubes in one layer times the number of layers.

Interdisciplinary Connections Technology Integration

- Language Arts - Interactive Student Notebook
- Language Arts- reading comprehension (decoding words, vocabulary study), problem solving ("problem of the day", word problems, identifying important information), writing ("writing to explain" mathematical thinking)
- Language Arts- Students will use reading comprehension skills to problem solve and effectively explain their mathematical thinking in written form using mathematical terms
- Language Arts: Students will connect everyday vocabulary to strengthen their understanding of mathematical terms
- Science- representing data, discovering patterns, reading temperature to analyze climates
- Science- utilizing measuring tools to create model, utilizing measurement tools to measure results of an experiment, analyzing data to form new

theories, choosing the "best" way to represent data, using data to prove a theory
- Science: Students will collect and analyze data and make calculations involving measurements and other data across all modules (Life Science, Physical Science, Earth Science
- Social Studies- understand how to read dates properly
    - **8.1.5.A.1** Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems ● **8.1.5.A.3** Use a graphic organizer to organize information about problem or issue.
    - **8.2.5.C.4** Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.
    - **8.2.5.D.3** Follow step by step directions to assemble a product or solve a problem

Grade 5: Interdisciplinary Connections
____ Language Arts ____ Science ____ Social Studies ____ World Languages ____ Arts
21st Century Themes
___ Global Awareness ___ Financial, Economic, Business and Entrepreneurial Literacy ___ Civic Literacy ___ Health Literacy ___ Environmental Literacy

21st Century Life and Careers Standards

<u>**Career Ready Practices:**</u>

☒ 9.4.5.DC.1: Explain the need for and use of copyrights

☒ 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity (e.g., 8.2.5.ED.2, 1.5.5.CR1a)

☒ 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.

☒ 9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6)

☐ 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2)

☐ 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2)

☐ 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.

☒ 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1)

☒ 9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.

☒ 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

☐ 9.1.5. EG.5: Identify sources of consumer protection and assistance..

☒ 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3)

Unit 3 Grade 5- More Operations on Fractions		
Content Standards	**Suggested Standards for Mathematical Practice and P21 Skills**	**Critical Knowledge & Skills**

● 5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
 	
    5.NF.B.4b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
	MP.1 Make sense of problems and persevere in solving them.
	MP.2 Reason abstractly and quantitatively.
	MP.3 Construct viable arguments and critique the reasoning of others.
	MP.4 Model with mathematics.
	MP.5 Use appropriate tools strategically.
	MP.6 Attend to precision.
	MP.7 Look for and make use of structure.
	MP.8 Look for and express regularity in repeated reasoning.
	
	Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration Information Literacy
	ICT Literacy
		Concept(s): No new concept(s) introduced
		Students are able to:
		    ● multiply fractional side lengths to find areas of rectangles.
		    ● represent fraction products as rectangular areas.
		    ● multiply a fraction by a whole number.
		    ● multiply a fraction by a fraction, in general, if q is a fraction c/d, then $(a/b) \times (c/d) = a(1/b) \times c(1/d) = ac \times (1/b)(1/d) = ac(1/bd) = ac/bd$.
		
		Learning Goal 1: Multiply fractions by whole numbers and fractions by fractions, drawing visual models to represent products, showing $(a/b) \times (c/d) = ab(1/bd)$, and creating story contexts.

● 5.NF.B.5. Interpret multiplication as scaling (resizing), by:
5.NF.B.5a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
5.NF.B.5b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing
	MP.2 Reason abstractly and quantitatively.
	MP.4 Model with mathematics.
	MP.6 Attend to precision.
	MP.7 Look for and make use of structure.
	
	Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration
		Concept(s):
		    ● Multiplication as resizing (scaling)
		Students are able to:
		    ● compare the size of a product to the size of one of its factors, considering the size of the other factor (at least one factor is a fraction). ● explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number.
		    ● explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number.
		    ● explain that multiplying a given number by a fraction equivalent to 1 does not change the product.

multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n×a)/(n×b)$ to the effect of multiplying a/b by 1.		Learning Goal 2: Explain how a product is related to the magnitude of the factors, including cases in which one factor is a fraction greater than 1 and cases in which one factor is a fraction less than 1.

● 5.NF.B.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	MP.4 Model with mathematics. MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
	
	Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration Information Literacy Media Literacy ICT Literacy
		Concept(s): No new concept(s) introduced
		Students are able to:
		  ● multiply fractions and mixed numbers in order to solve real world problems.
		  ● represent the solution to these real-world problems with visual fraction models and equations.
		
		Learning Goal 3: Solve real-world problems involving multiplication of fractions (including mixed numbers), using visual fraction models or equations to represent the problem.

● 5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. *(benchmarked)	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others.	Concept(s): No new concept(s) introduced Students are able to: ● use a story context to interpret division of a unit fraction by a whole number. ● divide of a unit fraction by a whole number and represent with visual fraction models.

5.NF.B.7a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.* 5.NF.B.7b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* 5.NF.B.7c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*	MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration ICT Literacy	● use a story context to interpret division of a whole number by a unit fraction. ● divide of a whole number by a unit fraction and represent with visual fraction models. ● divide unit fractions by whole numbers to solve real-world problems, using visual fraction models and equations to represent the problem. ● divide whole numbers by unit fractions to solve real-world problems, using visual fraction models and equations to represent the problem. Learning Goal 4: Divide a unit fraction by a non-zero whole number and interpret by creating a story context or visual fraction model. Learning Goal 5: Divide a whole number by a unit fraction and interpret by creating a story context or visual fraction model. Learning Goal 6: Solve real-world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.
● 5.NBT. A.2. Explain patterns in the number of zeros of the product	MP.2 Reason abstractly and quantitatively.	Concept(s): No new concept(s) introduced Students are able to:

when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation	● explain patterns in the placement of the decimal point when multiplying or dividing a decimal by powers of 10. ● write powers of 10 using whole-number exponents. Learning Goal 7: Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10; represent powers of 10 using whole-number exponents.
● 5.NBT. B.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration	Concept(s): No new concept(s) introduced Students are able to: ● add and subtract decimals to hundredths using concrete models and drawings. ● multiply and divide decimals to hundredths using concrete models and drawings. ● add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. ● relate the strategy to the written method and explain the reasoning used. Learning Goal 8: Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; explain the reasoning used, relating the strategy to the written method.

● 5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration Information Literacy Media Literacy ICT Literacy	Concept(s): Measurement units can be converted within a given measurement system. Students are able to: ● convert from one measurement unit to another within a given measurement system (e.g., convert 5 cm to 0.05 m, convert minutes to hours). ● solve multi-step, real world problems that require conversions. Learning Goal 9: Convert standard measurement units within the same system (e.g., centimeters to meters) in order to solve multi-step problems.

Unit 3 Grade 5- More Operations on Fractions

District/School Formative Assessment Plan District/School Summative Assessment Plan Benchmark Assessment Alternative Assessment

Released item sets https://sites.google.com/site/releaseditemsets/ formative assessment material- Engageny.org under their New York State Mathematics Curriculum Materials: https://www.engageny.org/sites/default/files/resourc e/atta chments/g5-m1-full-module.pdf NC 3-5 Instructional and Assessment Tasks for the CCSS in Mathematics http://3-5cctask.ncdpi.wikispaces.net/Fifth+Grade+Tasks	Georgia Formative Assessment Task https://www.georgiastandards.org/Georgia-Standards/Fra meworks/5th-Math-Unit-4.pdf Georgia Formative Assessment Tasks https://www.georgiastandards.org/Georgia-Standards/Fra meworks/5th-Math-Unit-3.pdf Classwork Exit tickets	White boards Individual and group work Benchmarks Chapter tests End of unit tests Performance tasks Extended projects PARCC Renaissance Learning Renaissance/STAR	MAP Testing DRA Assessment Benchmark Assessment within Envision/Go Math/Eurek/iReady State Testing Results Teacher Created Assessments Performance Based Assessments Extension Projects

Key:
Math journals

Quizzes

Focus Mathematical Concepts- More Operations on Fractions

Prerequisite skills:
4.NF.B.4
3.MD.C.7
3.OA.A.1

3.OA.A.2
4.MD.A.2
4.NF.A.1
4.OA.A.1
4.OA.A.2
3.NF.A.1
3.OA.B.6
4.NF.B.4
4.NBT.B.4

Both customary and standard measurement systems are included; students worked with both metric and customary units of length in second grade. In third grade, students work with metric units of mass and liquid volume. In fourth grade, students work with both systems and begin conversions within systems in length, mass and volume. Fifth graders build on their prior knowledge of related measurement units to determine equivalent measurements. Prior to making actual conversions, they examine the units to be converted, determine if the converted amount will be more or less than the original unit, and explain their reasoning. They use several strategies to convert measurements. When converting metric measurement, students apply their understanding of place value and decimals

Common Misconceptions:
Multiplication can increase or decrease a number. From previous work with computing whole numbers, students understand that the product of multiplication is greater than the factors. However, multiplication can have a reducing effect when multiplying a positive number by a decimal less than one or multiplying two decimal numbers together. We need to put the term multiplying into a context with which we can identify and which will then make the situation meaningful. Also using the terms times and groups of interchangeably can assist with the contextual understanding.

Key:

When solving problems that require renaming units, students use their knowledge of renaming the numbers as with whole numbers. Students need to pay attention to the unit of measurement which dictates the renaming and the number to use. The same procedures used in renaming whole numbers should not be taught when solving problems involving measurement conversions. For example, when subtracting 5 inches from 2 feet, students may take one foot from the 2 feet and use it as 10 inches. Since there were no inches with the 2 feet, they put 1 with 0 inches and make it 10 inches.

Number Fluency:
5.NBT.B.5 Multi-digit multiplication

District/School Tasks District/School Primary and Supplementary Resources

PARCC released items
https://prc.parcconline.org/assessments/parcc-released-items

Math release set folder- contains two Word docs
https://sites.google.com/site/releaseditemsets/home/math-release-1

PARCC practice tests
https://parcc.pearson.com/practice-tests/math/

NC tasks/assessments

http://3-5cctask.ncdpi.wikispaces.net/

    Framework for 21st Century Learning

http://www.p21.org/our-work/p21-framework

NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/

Arizona flip book

http://www.katm.org/flipbooks/5%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces

45 | Page Key:

http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Grade 5

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

TECHNOLOGY CONNECTIONS
http://www.dreambox.com/k-8-math-lessons students use a scrolling number line to "zoom in" and "zoom out" to a specific range on the number line, to help students understand the relative magnitude of decimal numbers. www.gogetwaggle.com www.commoncoresheets.com

www.studyisland.com
www.math-aids.com
www.sumdog.com
www.tenmarks.com
www.edulastic.com
www.go.math.com

Google Classroom

Essential Questions

What does dividing a unit fraction by a whole number look like?

What does dividing a whole number by a unit fraction look like?

What does it mean to decompose fractions or mixed numbers?

 What strategies can you use to estimate measurements?

What happens to a measurement when you change its unit of measure to a related unit?

How can we use exponents to represent powers of 10?

How does multiplying or dividing by a power of ten affect the product?

How can we use models to help us multiply and divide decimals?

How do the rules of multiplying whole numbers relate to multiplying decimals?

How are multiplication and division related?

How are factors and multiples related to multiplication and division?

What are some patterns that occur when multiplying and dividing by decimals?

How can we efficiently solve multiplication and division problems with decimals?

46 | Page Key:

What strategies are effective for finding a missing factor or divisor?

How can we check for errors in multiplication or division of decimals?

Special Education Students English Language Learners Students at risk of School Failure Gifted and Talented Students

Special Education Students	English Language Learners	Students at risk of School Failure	Gifted and Talented Students
● Provide a checklist for long, detailed tasks ● Use concrete examples of concepts before teaching the abstract ● Highlight important concepts to be learned in text of material ● Provide concrete examples for homework/class work assignments ● Give additional presentations by varying the methods using repetition, simpler explanations and modeling ● Give written directions to supplement verbal directions ● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers ● Utilize manipulative, hands-on	activities ● Provide graph paper for computation ● Additional time to complete activities/assignments/projects/assess ments ● Modify or provide an option for alternative activities/assignments/projects/assess ments ● Use enVision Spanish Resources ● Provide text to speech for math problems ● Use of translation dictionary or software ● Confer frequently ● Adapt a Strategy-Adjusting strategies for ESL students: http://www.teachersfirst.com/c on	tent/esl/adaptstrat.cfm ● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers ● Utilize manipulative, hands-on activities ● Additional Support Materials/ Online resources ● Guided Notes or copy of teacher notes ● Review prerequisite skills ● http://www.wida.us/standards/ elp.aspx ● Tiered interventions following RTI framework ● RTI Intervention Bank ●	NJDOE resources ● Utilize online resources such as www.tenmarks.com ● EnVision K-5 intervention supports ● Modify activities/assignments/projects/as sessments ● Provide an option for alternative activities/assignments/projects/as sessments ● Provide higher-order questioning and discussion opportunities ● Utilize exploratory connections to higher grade concepts ● Modify Content ● Adjust Pacing of Content ● Small Group Enrichment ● Individual Enrichment

- Higher-Level Text
- Provide whole group enrichment explorations
- Teach cognitive and

methodological skills
- Use center, stations, or contracts ●
Organize integrated
problem-solving simulations

- Propose interest-based extension activities
- Create an enhanced set of introductory activities (e.g.

advance organizers, concept maps, concept puzzles

Key:

●SmallGroup
Instruction/Intervention/Remediation
●IndividualIntervention/Remediation
●AdditionalSupportMaterials/Online
resources
●GuidedNotesorcopyofteachernotes
●Reviewprerequisiteskills
●AfterSchoolTutoring
●Chunk
activities/assignments/projects/assess
mentsintomanageableunits
●Allowstudenttoreceivereadingtext
invariousforms(written,verbal,
audio)ronalowerreadinglevel
●Allowstudenttomaketestcorrections
orretakeassessment
●AdjustPacingofContent
●SeeIEPsofstudentsforspecific
modifications
Studentswith504Plans

●Provideachecklistforlong,detailedtasks
●Useconcreteexamplesofconcepts
beforeteachingtheabstract
●Highlightimportantconceptstobe
learnedintextofmaterial
●Provideconcreteexamplesfor
homework/classworkassignments
●Giveadditionalpresentationsby
varyingthemethodsusingrepetition,
simplerexplanationsandmodeling

●Provideoptions,alternativesand
choicestodifferentiateand
broadenthecurriculum
●Proposeindependentprojects
basedonindividualinterests
●AdditionalSupportMaterials/
Onlineresources
●Afterschoolclubs
●Tieredcenters
●Tieredassignments

Key:
- Give written directions to supplement verbal directions
- Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers
- Utilize manipulative, hands-on activities
- Provide graph paper for computation ● Additional time to complete activities/assignments/projects/assess ments
- Modify or provide an option for alternative

activities/assignments/projects/assessments

- Small Group Instruction/Intervention/Remediation
- Individual Intervention/Remediation
- Additional Support Materials/ Online resources
- Guided Notes or copy of teacher notes
- Review prerequisite skills
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- Allow student to receive reading text in various forms (written, verbal, audio) r on a lower reading level
- Allow student to make test corrections or retake assessment
- Adjust Pacing of Content

- See 504 plan for specific accommodations

Vocabulary Ongoing Modifications

Building the language of mathematics

http://maccss.ncdpi.wikispaces.net/file/view/2014+Building+Vocabulary.pdf

Instructional Best Practices and Exemplars

Georgia Department of Education Grade 5 Intervention Table

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx Differentiated centers

Extra time on task

NJ Model Curriculum:

https://www.state.nj.us/education/bilingual/curriculum/

Achieve the Core:

https://achievethecore.org/aligned/ccss-aligned-materials-for-ell-students/

As students developed efficient strategies to do whole number operations, they should also develop efficient strategies with decimal operations. Students should learn to estimate decimal computations before they compute with pencil and paper. The focus on estimation should be on the meaning of the numbers and the operations, not on how many decimal places are involved.

Students should gain ease in converting units of measures in equivalent forms within the same system. To convert from one unit to another unit, the relationship between the units must be known. In order for students to have a better understanding of the relationships between units, they need to use measuring tools in class. The number of units must relate to the size of the unit. For example, students have discovered that there are 12 inches in 1 foot and 3 feet in 1 yard. This understanding is needed to convert inches to yards. Using 12-inch rulers and yardsticks, students can see that three of the 12-inch rulers are equivalent to one yardstick (3×12 inches = 36 inches; 36 inches = 1 yard). Using this knowledge, students can decide whether to multiply or divide when making conversions.

Key:
Once students have an understanding of the relationships between units and how to do conversions, they are ready to solve multi-step problems that require conversions within the same system. Allow students to discuss methods used in solving the problems. Begin with problems that allow for renaming the units to represent the solution before using problems that require renaming to find the solution.

Interdisciplinary Connections Technology Integration

- Language Arts - Interactive Student Notebook
- Language Arts- reading comprehension (decoding words, vocabulary study), problem solving ("problem of the day", word problems, identifying important information), writing ("writing to explain" mathematical thinking)
- Language Arts- Students will use reading comprehension skills to problem solve and effectively explain their mathematical thinking in written form using mathematical terms
- Language Arts: Students will connect everyday vocabulary to strengthen their understanding of mathematical terms ● Science- representing data, discovering patterns, reading temperature to analyze climates
- Science- utilizing measuring tools to create model, utilizing measurement tools to measure results of an experiment, analyzing data to form new theories, choosing the "best" way to

represent data, using data to prove a theory
● Science: Students will collect and analyze data and make calculations involving measurements and other data across all modules (Life Science, Physical Science, Earth Science ● Social Studies- understand how to read dates properly

- **8.1.5.A.1** Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems

- **8.1.5.A.3** Use a graphic organizer to organize information about problem or issue.
- **8.2.5.C.4** Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models.
- **8.2.5.D.3** Follow step by step directions to assemble a product or solve a problem

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Grade 5: Interdisciplinary Connections

_____ Language Arts _____ Science _____ Social Studies _____ World Languages _____ Arts

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21ˢᵗ Century Themes

___ Global Awareness ___ Financial, Economic, Business and Entrepreneurial Literacy ___ Civic Literacy ___ Health Literacy ___ Environmental Literacy

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21ˢᵗ Century Life and Careers Standards

Career Ready Practices:

☒ 9.4.5.CI.3: Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity
(e.g., 8.2.5.ED.2, 1.5.5.CR1a)

☒ 9.4.5.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process (e.g., W.4.7, 8.2.5.ED.6)

☐ 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2)

☒ 9.4.5.DC.1: Explain the need for and use of copyrights

☒ 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions.

☐ 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2)

☒ 9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1)

☒ 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

☒ 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3)

☐ 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors.

☒ 9.1.5.EG.3: Explain the impact of the economic system on one's personal financial goals.

☐ 9.1.5. EG.5: Identify sources of consumer protection and assistance..

Unit 4 Grade 5- Coordinate Geometry and Classifying Figures		
Content & Practice Standards	Suggested Standards for Mathematical Practice and P21 Skills	Critical Knowledge & Skills

● 5.G.A.1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.
	
	Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration ICT Literacy
		Concept(s):
		    ● Coordinate plane as perpendicular number lines.
		    ● Perpendicular number lines (axes) define a coordinate system.
		    ● Intersection of the lines (origin) coincides with the 0 on each number line. ●
		    Given points in the plane is located using an ordered pair of numbers (coordinates).
		    ● First numbers in an ordered pair indicates how far to travel from the origin in the direction of the x-axis.
		    ● Second numbers in an ordered pair indicate how far to travel in the direction of the y-axis.
		Students are able to:
		    ● graph points defined by whole number coordinates in the first quadrant of the coordinate plane in order to represent real world and mathematical problems. ● interpret coordinates in context.
		
		Learning Goal 1: Represent real world and mathematical problems by graphing points defined by whole number coordinates in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate). ● 5.G.A.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.		
● 5.OA.A.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms*	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation	Concept(s): No new concept(s) introduced Students are able to: 　　　● use two rules to create two numerical patterns. 　　　● compare corresponding terms (e.g. compare the first terms in each list, compare the second terms in each list, etc.). 　　　● identify the relationship between corresponding terms and write ordered pairs. 　　　● graph the ordered pairs. Learning Goal 2: Generate two numerical patterns from two given rules, identify the relationship between corresponding terms, create ordered pairs and graph the ordered pairs.

in the other sequence. Explain informally why this is so.		
● 5.G.B.3. Understand that attributes belonging to a	MP.2 Reason abstractly and quantitatively.	Concept(s):

category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.* ● 5.G.B.4. Classify two-dimensional figures in a hierarchy based on properties.	MP.3 Construct viable arguments and critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration	● Attributes belonging to a category of two-dimensional figures also belong to *all* subcategories of that category. Students are able to: ● classify two-dimensional figures (triangles, quadrilaterals) based on shared attributes (e.g. parallel sides, number of sides, angle size, side length, etc.). ● arrange the categories/subcategories of figures (e.g. squares, rectangles, trapezoids, etc) in a hierarchy based on attributes. ● identify attributes of a two-dimensional shape based on attributes of the categories to which it belongs. Learning Goal 3: Classify two- dimensional figures in a hierarchy based on properties.
● 5.MD.B.2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration Information Literacy ICT Literacy	Concept(s): No new concept(s) introduced Students are able to: ● use measurement information to create a line plot. ● using measurement information presented in line plots, add, subtract, multiply and divide fractions in order to solve problems. Learning Goal 4: Make a line plot to display a data set in measurements in fractions of a unit (1/2, 1/4, 1/8) and use it to solve problems involving the four operations on fractions with unlike denominators.

● 5.NBT. B.5. Fluently multiply multi-digit whole numbers using the standard algorithm. *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	Concept(s): No new concept(s) introduced Students are able to: ● multiply multi-digit whole numbers with accuracy and efficiency. Learning Goal 5: Fluently multiply multi-digit whole numbers with accuracy and efficiency.

	MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration	
● 5.NBT. B.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. *(benchmarked)	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure. Critical Thinking and Problem Solving Creativity and Innovation Communication and Collaboration	Concept(s): No new concept(s) introduced Students are able to: ● add and subtract decimals to hundredths using concrete models and drawings. ● multiply and divide decimals to hundredths using concrete models and drawings. ● add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. ● relate the strategy to the written method and explain the reasoning used. Learning Goal 6: Add, subtract, multiply, and divide decimals to hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; explain the reasoning used, relating the strategy to the written method.

● 5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. *(benchmarked)
 	
5.NF.B.7c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.
	MP.1 Make sense of problems and persevere in solving them.
	MP.2 Reason abstractly and quantitatively.
	MP.3 Construct viable arguments and critique the reasoning of others.
	MP.4 Model with mathematics.
	MP.5 Use appropriate tools strategically.
	MP.6 Attend to precision.
	MP.7 Look for and make use of structure.
	MP.8 Look for and express regularity in repeated reasoning.
	
	Critical Thinking and Problem Solving
		Concept(s): No new concept(s) introduced
		Students are able to:
		    ● use a story context to interpret division of a unit fraction by a whole number. ● use a story context to interpret division of a whole number by a unit fraction. ● divide unit fractions by whole numbers to solve real world problems, using visual fraction models and equations to represent the problem.
		    ● divide whole numbers by unit fractions to solve real world problems, using visual fraction models and equations to represent the problem.
		
		Learning Goal 7: Solve real world problems involving division of unit fractions by whole numbers or whole numbers by unit fractions.

For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?	Creativity and Innovation Communication and Collaboration Information Literacy	

Unit4 Grade 5- Coordinate Geometry and Classifying Figures

District/School Formative Assessment Plan District/School Summative Assessment Plan

Released item sets
https://sites.google.com/site/releaseditemsets/

formative assessment material-
Engageny.org under their New York
State Mathematics Curriculum

Materials:

https://www.engageny.org/sites/defaul
t/files/res ource/attachments/g5-m1-
full-module.pdf

Individual and group work

Math journals
Benchmarks

Chapter tests

NC 3-5 Instructional and Assessment
Tasks for the CCSS in Mathematics
http://3-
5cctask.ncdpi.wikispaces.net/Fifth+Gr
a de+Tasks
Classwork

End of unit tests

Performance tasks Extended projects

PARCC

Exit tickets

Renaissance Learning

White boards

Benchmark Assessment Alternative Assessment

Renaissance/STAR MAP Testing

Extension Projects

DRA Assessment 58 | Page Key:

Teacher Created Assessments

Performance Based Assessments
Benchmark Assessment within Envision/Go

Math/Eurek/iReady

State Testing Results

Focus Mathematical Concepts- Coordinate Geometry and Classifying Figures

Prerequisite skills:
3.NF.A.2
4.G.A.2
4.MD.C.5
4.MD.B.4
4.NF.B.3
4.NBT.B.4
4.NBT.B.5

Common Misconceptions:
When playing games with coordinates or looking at maps, students may think the order in plotting a coordinate point is not important. Have students plot points so that the position of the coordinates is switched. For example, have students plot (3, 4) and (4, 3) and discuss the order used to plot the points. Have students create directions for others to follow so that they become aware of the importance of direction and distance.

Students think that when describing geometric shapes and placing them in subcategories, the last category is the only classification that can be used.

Some students will need additional help in understanding that it is possible to graph with fractions. This may be their first experience. Students may not always establish the correct locations on the x-coordinate.

Number Fluency:
5.NBT.B.5 Multi-digit multiplication

District/School Tasks District/School Primary and Supplementary Resources

PARCC released items Framework for 21st Century Learning

Key:
https://prc.parcconline.org/assessments/parcc-rel eased-items

PARCC practice tests
https://parcc.pearson.com/practice-tests/math/

Math release set folder- contains two Word docs https://sites.google.com/site/releaseditemsets/ho me/math-release-1

NC tasks/assessments

http://3-5cctask.ncdpi.wikispaces.net/ engageNY Module 6:

https://www.engageny.org/resource/grade-5-mat hematics-module-6
http://www.p21.org/our-work/p21-framework

NJDOE-21st Century Life and Careers

http://www.state.nj.us/education/aps/cccs/career/

Arizona flip book

http://www.katm.org/flipbooks/5%20FlipBook%20Final%20CCSS%202014.pdf

North Carolina wikispaces

http://maccss.ncdpi.wikispaces.net/Elementary

Georgia Department of Education Grade 5

https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx

Key:

www.sumdog.com
www.tenmarks.com
www.edulastic.com
www.go.math.com

Google Classroom

Essential Questions

How does the coordinate system work?

How do coordinate grids help you organize information?

What relationships can be determined by analyzing two sets of given rules? How might a

coordinate grid help me understand a relationship between two numbers? How can we

TECHNOLOGY CONNECTION:

http://calculationnation.nctm.org/Games/ This site, from NCTM, has engaging and sometimes addictive games for practicing calculations based on strategy. http://www.k-5mathteachingresources.com/
This site offers simple contextual problems to use to extend and support students in their understanding of fraction computation. http://www.crickweb.co.uk/ks2numeracy-shape-and-weight.html#quad
Play the Polygon Capture game
http://www.nctm.org/standards/content.aspx?id=25040
This interactive activity explores geometric relationships and make and test conjectures.
http://illuminations.nctm.org/LessonDetail.aspx?ID=L350
In this lesson, from Illuminations, students use dynamic software to examine the properties of rectangles and parallelograms and then identify what distinguishes a rectangle from a more general parallelogram. Using spatial relationships, they examine the properties of two- and three-dimensional shapes. The lesson links to a virtual manipulative that allows students to compare rectangles and parallelograms.

www.gogetwaggle.com
www.commoncoresheets.com
www.studyisland.com
www.math-aids.com

represent numerical patterns on a coordinate grid?

How can a line graph help us determine relationships between two numerical patterns?

How can the coordinate system help you better understand other map systems? How is data

collected and displayed on a line plot?

What strategies help when solving problems with line plots?

How can plane figures be categorized and classified?

What is a quadrilateral?

What are the properties of quadrilaterals?

How can you classify different types of quadrilaterals?

How are quadrilaterals alike and different?

Key:

How can angle and side measures help us to create and classify triangles?

Where is geometry found in your everyday world?

What careers involve the use of geometry?

Why are some quadrilaterals classified as parallelograms?

Why are kites not classified as parallelograms?

Why is a square always a rectangle?

What are ways to classify triangles?

Special Education Students English Language Learners Students at Risk of School Failure Gifted and Talented Students

● Use concrete examples of concepts before teaching the abstract

● Highlight important concepts to be learned in text of material

● Provide concrete examples for homework/class work assignments ● Give additional presentations by varying

● Provide a checklist for long, detailed tasks

the methods using repetition, simpler explanations and modeling ● Give written directions to supplement verbal directions
● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers
● Use enVision Spanish Resources ● Provide text to speech for math problems
● Use of translation dictionary or software
● Confer frequently

● Adapt a Strategy-Adjusting strategies for ESL students:
http://www.teachersfirst.com/con tent/esl/adaptstrat.cfm
● Familiarize student with new vocabulary before beginning lesson ● Utilize visual aids and graphic organizers
● Utilize manipulative, hands-on activities
● Tiered interventions following RTI framework
● RTI Intervention Bank

● NJDOE resources
● Utilize online resources such as www.tenmarks.com
● EnVision K-5 intervention supports
● Modify activities/assignments/projects/assessments Provide an option for alternative activities/assignments/projects/assessments ● Provide higher-order questioning and discussion opportunities
● Utilize exploratory connections to higher grade concepts
● Modify Content

● Adjust Pacing of Content
● Small Group Enrichment
● Individual Enrichment
● Higher-Level Text
● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts
● Organize integrated problem-solving simulations ● Propose interest-based extension activities

● Utilize manipulative, hands-on activities
● Provide graph paper for computation ● Additional time to complete activities/assignments/projects/assessm ents
● Modify or provide an option for alternative activities/assignments/projects/assessm ents
● Small Group Instruction/Intervention/Remediation ● Individual Intervention/Remediation ● Additional Support Materials/ Online resources
● Guided Notes or copy of teacher notes ● Review prerequisite skills
● After School Tutoring

● Chunk activities/assignments/projects/assessm ents into manageable units
● Allow student to receive reading text in various forms (written, verbal, audio) r on a lower reading level
● Allow student to make test corrections or retake assessment
● Adjust Pacing of Content
● See IEPs of students for specific modifications

Students with 504 Plans
● Additional Support Materials/ Online resources

● Guided Notes or copy of teacher notes
● Review prerequisite skills
● http://www.wida.us/standards/elp.as px
● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles
● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Propose independent projects based on individual interests
● Additional Support Materials/ Online resources ● After school clubs
● Tiered centers
● Tiered assignments

Key:
- Provide a checklist for long, detailed
    tasks
    - Use concrete examples of concepts
        before teaching the abstract
    - Highlight important concepts to be
        learned in text of material
- Provide concrete examples for
homework/class work assignments ● Give
additional presentations by varying the
methods using repetition, simpler
explanations and modeling ● Give written
directions to supplement verbal directions
- Familiarize student with new

vocabulary before beginning lesson ●
Utilize visual aids and graphic organizers

- Utilize manipulative, hands-on
  activities
- Provide graph paper for computation ●
Additional time to complete
  activities/assignments/projects/assessm
  ents
- Modify or provide an option for
  alternative
  activities/assignments/projects/assessm
  ents
- Small Group
  Instruction/Intervention/Remediation ●
Individual Intervention/Remediation ●
Additional Support Materials/ Online
resources
- Guided Notes or copy of teacher notes

Key:

- Review prerequisite skills
- After School Tutoring
- Chunk
  activities/assignments/projects/assessm
  ents into manageable units
- Allow student to receive reading text in
  various forms (written, verbal, audio) r
  on a lower reading level
- Allow student to make test corrections
  or retake assessment
- Adjust Pacing of Content
- See 504 plan for specific
  accommodations

Vocabulary Ongoing Modifications

Building the language of mathematics

Georgia Department of Education Grade 5 Intervention Table https://www.georgiastandards.org/Georgia-Standards/Pages/Math-K-5.aspx Differentiated centers

Extra time on task

Limited # of items

NJ Model Curriculum:

https://www.state.nj.us/education/bilingual/curriculum/

Achieve the Core:

https://achievethecore.org/aligned/ccss-aligned-materials-for-ell-students/

Key:

Students need to understand the underlying structure of the coordinate system and see how axes make it possible to locate points anywhere on a coordinate plane. This is the first time students are working with coordinate planes, and only in the first quadrant. It is important that students create the coordinate grid themselves. This can be related to two number lines and reliance on previous experiences with moving along a number line. Multiple experiences with plotting points are needed. Provide points plotted on a grid and have students name and write the ordered pair. Have students describe how to get to the location. Encourage students to articulate directions, attending to precision as they plot points. Present real-world and mathematical problems and have students graph points in the first quadrant of the coordinate plane. Gathering and graphing data is a valuable experience for students. It helps them to develop an understanding of coordinates and what the overall graph represents. Students also need to analyze the graph by interpreting the coordinate values in the context of the situation.

In Grade 4 students built, drew and analyzed two-dimensional shapes to deepen their understanding of the properties of two-dimensional shapes. They looked at the presence or absence of parallel and perpendicular lines or the presence or absence of angles of a specified size to classify two-dimensional shapes. Now, students classify two-dimensional shapes in a hierarchy based on properties. Details learned in earlier grades need to be used in the descriptions of the attributes of shapes. The more ways that students can classify and discriminate shapes, the better they can understand them. The shapes are not limited to quadrilaterals. Students can use graphic organizers such as flow charts or T-charts to compare and contrast the attributes of geometric figures. Have students create a T-chart with a shape on each side. Have them list attributes of the shapes, such as number of side, number of

angles, types of lines, etc. they need to determine what's alike or different about the two shapes to get a larger classification for the shapes and be able to explain these properties. Pose questions such as, "Why is a square always a rectangle?" and "Why is a rectangle not always a square?" Expect students to use precision in justifying and explaining their reasoning.

Using a line plot to solve problems involving operations with unit fractions now includes multiplication and division. Revisit using a number line to solve multiplication and division problems with whole numbers. In addition to knowing how to use a number line to solve problems, students also need to know which operation to use to solve problems. Use the tables for common addition and subtraction, and multiplication and division situations (Table 1 and Table 2 in the appendix as a guide to the types of problems students need to solve without specifying the type of problem. Allow students to share methods used to solve the problems. Also have students create problems to show their understanding of the meaning of each operation.

Students should have experienced generating and analyzing numerical patterns using a given rule in Grade 4. Given two rules with an apparent relationship, students should be able to identify the relationship between the resulting sequences of the terms in one sequence to the corresponding terms in the other sequence. For example, starting with 0, multiply by 4 and starting with 0, multiply by 8 which generates each sequence of numbers (0, 4, 8, 12, 16, …) and (0, 8, 16, 24, 32,…). Students should see that the terms in the second sequence are double the terms in the first sequence, or that the terms in the first sequence are half the terms in the second sequence. Have students form ordered pairs and graph them on a coordinate plane. Patterns can be also observed from the graphs. Graphing ordered pairs on a coordinate plane (as show above) is introduced to students in the Geometry domain where students solve real-world and mathematical problems. For the purpose of this cluster, use only the first quadrant of the coordinate plane, (which contains positive numbers) only. Provide coordinate grids for the students, but also have them make coordinate grids. In Grade 6, students will position pairs of integers on a coordinate plane. The graph of both sequences of numbers is a visual representation that will show the relationship between the two sequences of numbers. Encourage students to represent the sequences in T-Charts so they can see a connection between the graph and the sequences.

Interdisciplinary Connections Technology Integration

- Language Arts - Interactive Student Notebook
  - Language Arts- reading comprehension (decoding words, vocabulary study), problem solving ("problem of the day", word problems, identifying important

  information), writing ("writing to explain" mathematical thinking)
- Language Arts- Students will use reading comprehension skills to problem solve and effectively explain their mathematical thinking in written form using mathematical terms
- Language Arts: Students will connect everyday vocabulary to strengthen their understanding of mathematical terms
- Science- representing data, discovering patterns, reading temperature to analyze climates
- Science- utilizing measuring tools to create model, utilizing measurement tools to

- **8.1.5.A.1** Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems
  - **8.1.5.A.3** Use a graphic organizer to organize information about problem or issue.

  measure results of an experiment, analyzing data to form new theories, choosing the "best" way to represent data, using data to prove a theory
- Science: Students will collect and analyze data and make calculations involving measurements and other data across all modules (Life Science, Physical Science, Earth Science
- Social Studies- understand how to read dates properly
  - **8.2.5.C.4** Collaborate and brainstorm with peers to solve a problem evaluating all solutions to provide the best results with supporting sketches or models. ● **8.2.5.D.3**

Follow step by step directions to assemble a product or solve a problem